Career Academy Integrated Unit Plan

Academy Name: STEM – Tech Issues **School: UHS**
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Integrated Unit Plan Title: Forensics
Courses to integrate: Biology, Tech Issues, Geometry
Grade Level: 9
Timeline & Duration: 25 days (starting at the beginning of each quarter)

Unit Summary: Students will investigate how to gather and analyze evidence in a crime scene to prove their theories using a two column proof format.

Overview of Activities/Lessons per Course				
Course	Tech Issues	Biology	Geometry	
Activity/Lesson	Knowledge acquisition of Crime	Bone identification	Intro to Proofs	
Activity/Lesson	Culminating project – "Proofing Your Evidence" forensics expert testimony simulation	Physiology of fight or flight response.	Formal Proofs Blood Spatter – Angle of Impact calculation	

Lesson Instructions for __Tech Issues__:

Standards (Performance Tasks or Course Frameworks or Sunshine State Standards): Complete Forensics unit **Rigor & Relevance (quadrant): Quadrant C**
Instructions to Teacher: Prepare **Evidence Analysis Harbor** for knowledge acquisition- materials, artifacts, and worksheets
Instructions to Students: 1) Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to "prove" events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information.
Instructions for Student Accommodations: Allow students to work with partners
Assessment for Activity: Electronic assessment and Harbor Post Test
Approximate Length of Time for Activity: 25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – "Proofing Your Evidence"
Materials Needed: Harbor materials for knowledge acquisition stage
Resources Needed: FACES Composite program, Excel, human skeletal bones, Reading the Bones worksheet
Attachments: Student culminating project information sheets

Lesson Instructions for __Tech Issues__:

Standards (Performance Tasks or Course Frameworks or Sunshine State Standards): Complete Forensics unit **Rigor & Relevance (quadrant): Quadrant C**
Instructions to Teacher: Prepare **Crime Scene Harbor** for knowledge acquisition- materials, artifacts, and worksheets
Instructions to Students: 1) Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to "prove" events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information
Instructions for Student Accommodations: Allow students to work with partners
Assessment for Activity: Electronic assessment and Harbor Post Test
Approximate Length of Time for Activity: 25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – "Proofing Your Evidence"
Materials Needed: Harbor materials for knowledge acquisition stage
Resources Needed: FACES Composite program, Excel, human skeletal bones, Reading the Bones worksheet
Attachments: Student culminating project information sheets

Lesson Instructions for __Tech Issues__:

Standards (Performance Tasks or Course Frameworks or Sunshine State Standards): Complete Forensics unit **Rigor & Relevance (quadrant): Quadrant C**
Instructions to Teacher: Prepare **Crime Lab Harbor** for knowledge acquisition- materials, artifacts, and worksheets
Instructions to Students: 1) Complete Segments 1-7 in two Harbors, 2)Analyze forensic evidence to "prove" events at a crime scene using a geometric two column proof format, 3) in a mock testimony- provide this information
Instructions for Student Accommodations: Allow students to work with partners
Assessment for Activity: Electronic assessment and Harbor Post Test
Approximate Length of Time for Activity: 25 days – 10 days spent in two Harbors for knowledge acquisition – 5 days culminating project – "Proofing Your Evidence"
Materials Needed: Harbor materials for knowledge acquisition stage
Resources Needed: FACES Composite program, Excel, human skeletal bones, Reading the Bones worksheet
Attachments: Student culminating project information sheets

Lesson Instructions for __Biology__:

Standards (Performance Tasks or Course Frameworks or Sunshine State Standards): **Rigor & Relevance (quadrant):** SC.912.L.14.34 Describe the composition and physiology of blood, including that of the plasma and the formed elements. SC.912.L.14.30 - Compare endocrine and neural controls of physiology. SC.912.L.14.31 - Describe the physiology of hormones including the different types and the mechanisms of their control. SC.912.L.14.32 - Describe the anatomy and physiology of the endocrine system. SC.912.L.14.21 - Describe the anatomy and physiology of the central and peripheral nervous system and name the major divisions of the nervous system. SC.912.L.14.49 - Identify the major functions associated with the sympathetic and parasympathetic nervous systems. SC.912.L.14.12 - Describe the anatomy and histology of bone tissue. SC.912.L.14.13 - Distinguish between the bones of the axial skeleton and the appendicular skeleton. SC.912.L.14.14 - Identify the major bones of the axial and appendicular skeleton.
Instructions to Teacher: Provide instruction via centers in classroom for the topics of physiology and composition blood, bone recognition, physiological changes the body during fight or flight response,
Instructions to Students: Complete the information guides receive in the Tech Issues class by researching the topics in the centers in the Biology classroom and submit into Tech Issue Portfolio. Physiology and Composition of Blood, Fight or Flight Body Changes, Bone Recognition
Instructions for Student Accommodations: Students assigned to same Harbor in Tech Issues can work together.
Assessment for Activity: Student Tech Issues Portfolio additions of information guides Physiology and Composition of Blood, Fight or Flight Body Changes, Bone Recognition
Approximate Length of Time for Activity: During 25 day integrated unit titled- “Proofing Your Evidence”
Materials Needed: Student resource guides
Resources Needed: Centers for student research in biology class on previously mentioned topics

Attachments: Student Information guides

Lesson Instructions for __Geometry__:

Standards: MA.912.T.2.1 Understand and define the trigonometric ratios (sine, cosine, tangent) as they relate to the angles of a right triangle. **MA.912.G.5.3/MA.912.G.5.4 Use a variety of methods involving right triangles to solve real-world problems including trigonometric ratios** **Rigor & Relevance (quadrant): Quadrant C**
Instructions to Teacher: Short lesson on trigonometric ratios (not in depth, just an introduction) including SOH CAH TOA and how to use trig to analyze blood spatter.
Instructions to Students: Complete Blood Spatter worksheet
Instructions for Student Accommodations: Allow students to work in pairs or groups
Assessment for Activity: Answers to worksheet
Approximate Length of Time for Activity: 1 day (50 minute period)
Materials Needed: Compass, straight edge, calculator with sin functions
Resources Needed: Blood Spatter worksheet

Attachments: Blood Spatter Worksheet

Lesson Instructions for __Geometry__:

Standards: MA.912.D.6.3/MA.912.6.4 Determine whether a given short proof is logically valid. MA.912.G.8.2 Use a variety of problem solving strategies to include diagramming, charting, trial and error. MA.912.G.8.3 Determine if a solution is reasonable based on the given situation MA.912.G.8.4 Make conjectures and justify and support the conjectures with geometric proofs. Distinguish between information that supports a conjecture and the proof of a conjecture. MA.912.G.8.5 Write geometric proofs. Use a variety of ways to present deductive proofs, such as two-column proofs. **Rigor & Relevance (quadrant):** Quadrant C
Instructions to Teacher: Introduce the building blocks of proofs (including undefined terms, if then statements and two column proof structure) using Springboard Geometry Lesson 1-3.
Instructions to Students: Day 1: Complete Springboard: Back to the Beginning #1-4 (page 1 and 2) Day 2: Back to the Beginning #5-6 (page 3 through 5) Day 3: Back to the Beginning #7-10 (page 6 and 7)
Instructions for Student Accommodations: Allow students to work in pairs or groups
Assessment for Activity: Back to the Beginning: Check your understanding (page 8)
Approximate Length of Time for Activity: 3 days (50 minute periods)
Materials Needed: No special materials needed

Resources Needed: Springboard Geometry book or handouts
Attachments: Springboard pages

Lesson Instructions for __Geometry__:

Standards: MA.912.D.6.3/MA.912.6.4 Determine whether a given short proof is logically valid. MA.912.G.8.2 Use a variety of problem solving strategies to include diagramming, charting, trial and error. MA.912.G.8.3 Determine if a solution is reasonable based on the given situation MA.912.G.8.4 Make conjectures and justify and support the conjectures with geometric proofs. Distinguish between information that supports a conjecture and the proof of a conjecture. MA.912.G.8.5 Write geometric proofs. Use a variety of ways to present deductive proofs, such as two-column proofs. **Rigor & Relevance (quadrant):** Quadrant C
Instructions to Teacher: Remind students of the introduction to geometric proofs and emphasize how important showing each and every step is. Draw connections for the students between geometric proofs and proving guilt/innocence in a crime: all evidence presented needs to support conclusion all evidence must be considered need to determine who the "culprit" is based on evidence Provide students with notes and examples of two-column geometric proofs. Use textbook sections 2-5 and 2-6.
Instructions to Students: Complete practice proofs (geometric and practical) and evaluate other students' proofs. Day 1: Section 2-5 #1-13 odds, 14-41 Day 2: Section 2-6 #1-11 odd, 36-48 Day 3: Section 2-6 #13-35 Day 4: Additional practice proofs
Instructions for Student Accommodations: Work in pairs and small groups

Assessment for Activity: Chapter 2 Test
Approximate Length of Time for Activity: 3 – 4 days (50 minute periods)
Materials Needed: No special materials needed
Resources Needed: Geometry textbook, additional practice proofs
Attachments: Practice Proofs